INSECT DISEASE REPORT
USDA FOREST SERVICE/NORTHERN REGION

Report No. 73-25

5200
October 1973

STATUS OF BARK BEETLE INFESTATIONS IN SECOND-GROWTH PONDEROSA PINE STANDS, BUREAU OF LAND MANAGEMENT LANDS GARNET MOUNTAINS, MONTANA

by

Mark D. McGregor[1/] and Rudolph C. Lood[2/]

ABSTRACT

Mountain pine beetle infestations have increased in second-growth ponderosa pine stands in the Garnet Mountains since 1971. The extremely dry 1973 season resulted in an increase of ips engraver beetle activity that was responsible for over half of the tree mortality in 1973. Commercial thinning is recommended to alleviate the problem.

INTRODUCTION

Infestations of mountain pine beetle, *Dendroctonus ponderosae* Hopk., are increasing in 60- to 80-year-old second-growth ponderosa pine stands in the Garnet Mountains east of Missoula, Montana. Many new faded groups were mapped by aerial observers between Lyon Gulch and Turah, Montana, on Bureau of Land Management and National Forest lands during September 1973 (fig. 1). The mountain pine beetle was responsible for the majority of the mortality until 1973. However, the extremely hot, dry season this year has resulted in a population buildup of *Ips pini* Say and *Ips plastographus* (Lec.).

1/ Entomologist, USDA Forest Service, Region 1, Division of State and Private Forestry, Missoula, Montana.
2/ Biological technician, USDA Forest Service, Region 1, Division of State and Private Forestry, Missoula, Montana.

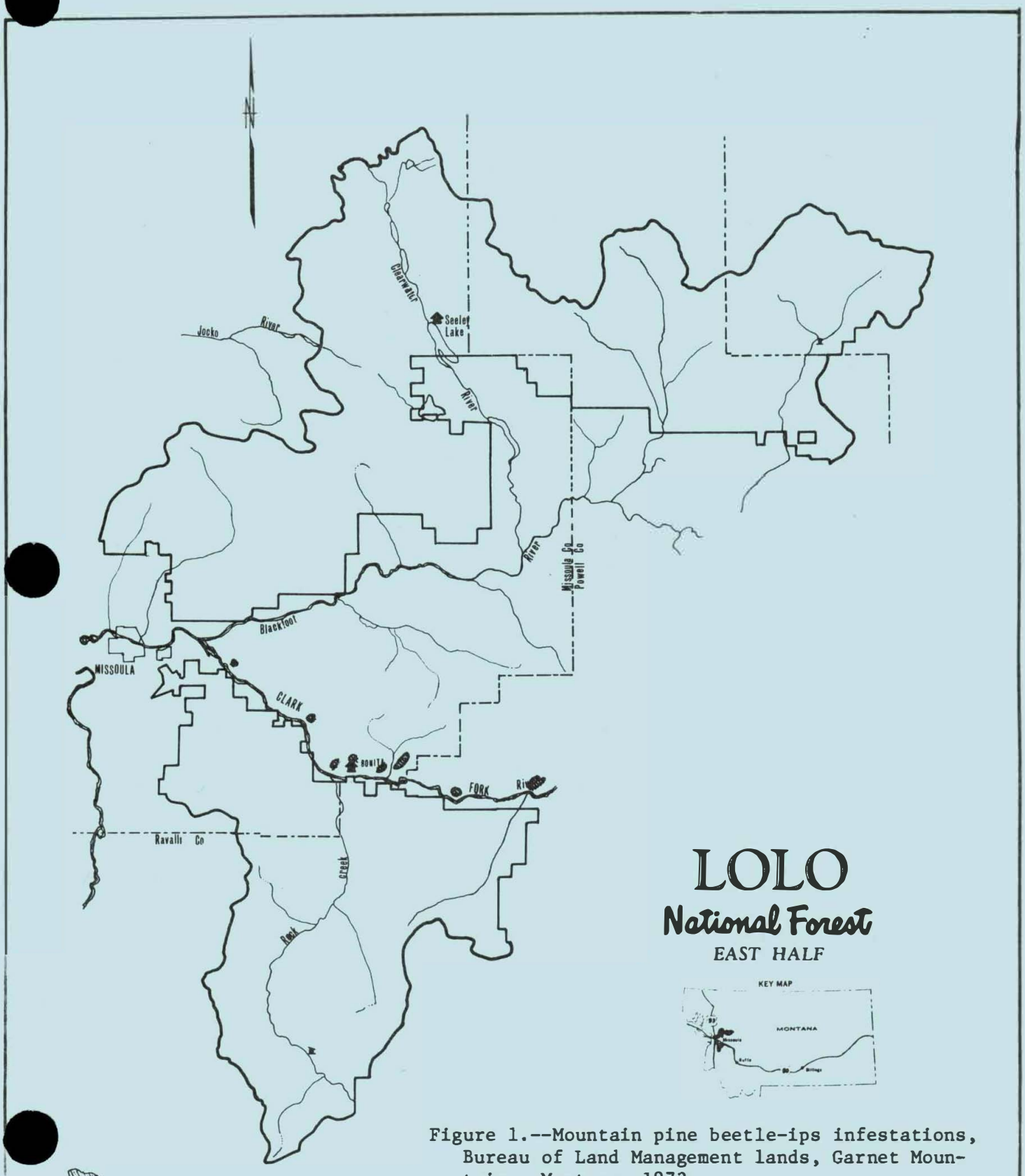

Figure 1.--Mountain pine beetle-ips infestations, Bureau of Land Management lands, Garnet Mountains, Montana, 1973.

Because of the increased amount of tree killing this year and proximity of these infested areas to Interstate 15 along the Clark Fork River, Leo Ryan, Bureau of Land Management forester, requested an evaluation to assess the current insect status and obtain data which might aid in promoting a commercial thinning program of infested stands to reduce incidence of bark beetle activity.

RESULTS

Results of data collected from five groups of infested trees are shown in table 1. Approximately 25 groups of "faders," ranging from 6 to 50 trees per group occur within the area examined. Infested trees range from 5 to 20 inches d.b.h. In the five infested groups examined, 9 percent of the trees were killed by mountain pine beetle, 33 percent by *Ips* spp., 32 percent by a combination of mountain pine beetle and *Ips*, and 25 percent had been top killed by *Ips* and were infested with the red turpentine beetle, *Dendroctonus valens* Lec., in the base. Infestation occurs only in overstocked, mostly pure ponderosa pine stands.

Table 1.--Data showing ponderosa pine killed by mountain pine beetle and *Ips* spp., BLM lands, Garnet Mountains, 1973

Group	Mountain pine beetle				*Ips* spp.		*Ips* top killed		Killed by *Ips* and mountain pine beetle	
	1973		1972							
	No. trees	Av. d.b.h.	No. trees	Av. d.b.h.	No. trees	Av. d.b.h.	No. trees	Av. d.b.h.	No. trees	Av. d.b.h.
I	1	8.0	12	10.5	8	6.3	7	8.8	11	8.0
II	0	0	3	7.6	8	5.7	4	10.7	2	6.5
III	0	0	1	8.0	0	0	5	8.8	2	8.0
IV	2	8.5	9	10.6	3	7.0	2	14.0	3	6.3
V	4	10.0	4	9.0	7	8.4	2	9.0	7	10.0
Total	7		29		26		20		23	
Average		8.6		13.8		6.8		10.2		7.6

DISCUSSION

The problem is basically related to overstocking. Ponderosa pine stands in overstocked condition generally are more susceptible to attack by mountain pine beetle (Sartwell 1971). Stands in these areas are essentially in the same condition as those in the Nine Mile drainage where mountain pine beetle has been a problem since 1969 (Ciesla and McGregor 1970). In second-growth stands, the mountain pine beetle has assumed the role once occupied by fire as a primary natural thinning agent. However,

when fire thins, dominant and codominant trees are more likely to be killed than are suppressed or intermediate trees. Also, infestations are more likely to occur where basal area is distributed in many stems than where it is concentrated in fewer stems.

The problem appears to have become complicated this year by *Ips* bark beetles due to the extreme dry season. Outbreaks of *Ips* usually coincide with periods of low moisture from May through August. They became a serious problem throughout the Clark Fork River drainage in 1966 and increased following the drought in 1967 (Dewey 1967).

In Region 1, *Ips* can maintain epidemic populations in thinning or logging slash, trees damaged by winds, ice storms, and other natural disasters (Tunnock, et al. 1968), trees suppressed by factors such as defoliation (Dewey, et al. 1971), or overstocking. Once populations of these beetles build to epidemic levels, tree killing can continue for 1 to 2 years.

RECOMMENDATIONS

Successful management of the bark beetle problem will depend on whether or not measures are taken to improve stand conditions. Research to date suggests that commercial thinning offers a solution to the problem. Intensity of thinning depends on the period of time to the next cutting. Since that period is about 30 years, Sartwell (1971) recommends that stands should be thinned to the following levels to prevent serious infestations of mountain pine beetle under eastern Oregon conditions:

Site	Basal area/acre
III	160
IV	140
V	120
VI	100

Concerning the buildup of *Ips* bark beetles that has occurred, thinning may present a problem, but we believe that by adhering to the following guidelines, tree killing by *Ips* may be maintained at a tolerable level during a commercial thinning operation:

1. Fell and remove trees now infested.

2. A continuous supply of logging slash should be maintained throughout the summer.

3. Thinning blocks should not be too large or spaced too far apart.

4. Remove decked trees as they become infested during the summer.

5. Slash exposed to direct sunlight will dry out faster than unexposed slash, resulting in brood mortality.

6. Skid trees to a central landing and burn infested slash if possible.

The bark beetle problem is expected to increase in 1974. Commercial thinning is encouraged to reduce the basal area/acre. This should eventually result in a release of the residual trees, making them less susceptible to bark beetle attack.

REFERENCES CITED

Ciesla, W. M., and M. D. McGregor, 1970. Impact of the mountain pine beetle on the Lolo National Forest, Montana. USDA Forest Serv., N. Reg., Div. State and Priv. Forestry, Missoula, Mont. 59801, report 71-7.

Dewey, J. E., 1967. Forest insect conditions in the Northern Region. USDA, Forest Serv., N. Reg., Div. State and Priv. Forestry, Missoula, Mont. 59801, p. 2.

Dewey, J. E., and H. E. Meyer, 1971. Evaluation of an engraver beetle, *Ips calligraphus* (Germar), following pine looper defoliation on the Ashland District, Custer National Forest, Montana. USDA, Forest Serv., N. Reg., Div. State and Priv. Forestry, Missoula, Mont. 59801, report 71-5.

Sartwell, C., 1971. Thinning ponderosa pine to prevent outbreaks of mountain pine beetle. Proceedings, precommercial thinning of Coastal and Intermountain forests in the Pacific Northwest Cooperative Extension Service and Department of Forestry and Range Management. Wash. State Univ., Pullman, Wash.

Tunnock, S., J. E. Dewey, and R. E. McEwan, 1968. Examination of ponderosa pine stands attacked by pine engraver beetles in western Montana and northern Idaho during 1966. USDA, Forest Serv., N. Reg., Div. State and Priv. Forestry, Missoula, Mont. 59801, 4 pp.